Nanoscale Quantum System: Excitations and Control

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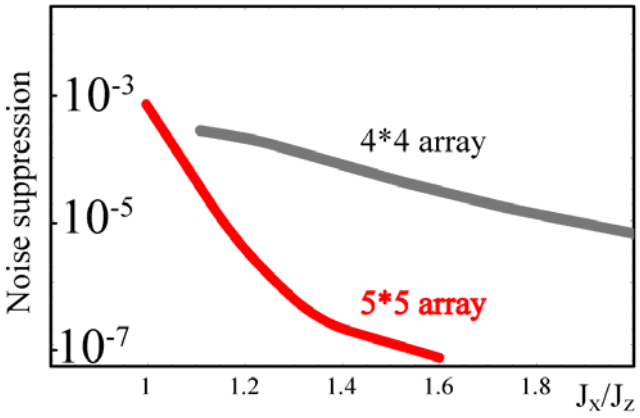
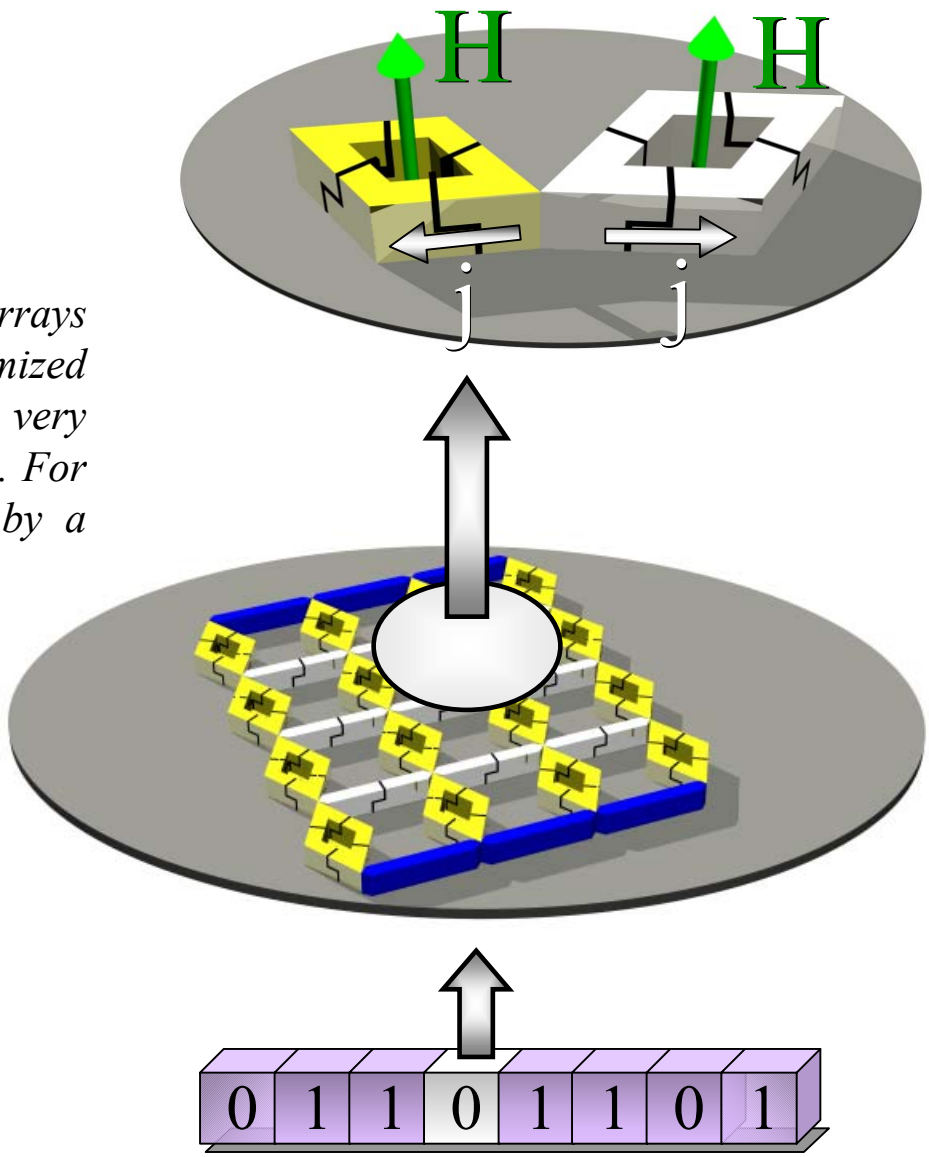
Protected Solid State Qubits.

Following our discovery of the Josephson junction arrays with non-trivial topology we designed and optimized medium sized arrays that are characterized by a very strong reduction of the noise coupling to environment. For example, the array shown here reduces the noise by a factor of 10^3 - 10^7

Phys Rev Lett 90, 107003 (2003);
Phys Rev Lett 92, 098301 (2003);
Phys Rev B, in press.





Education and outreach

Education.
Three graduate students participated in the grant funded research: I. Berdnikov, R. Usmanov, E. Yuzbashyan (PhD Sept 2004). Yuzbashyan is presently Assistant Professor at Rutgers University. Postgraduate training: L. Faoro, M. Muller, M. Rokhni, A. Silva.

Conferences and symposia organized by PIs on the research funded by the grant:

1. *Aspen Workshop, Summer 2002, "Collective Phenomena in Glassy Systems and Disordered Insulators"*
2. *KITP Workshop, March-June 2003, "Glassy States of Matter and Nonequilibrium Quantum Dynamics"*